PROBLEMS FOR SOLUTION.

ARITHMETIC.

146. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy, Defiance College, Defiance, O.

If the driving-wheels of Locomotive No. 200 on the Pennsylvania Railroad, $m=7$ feet in diameter, turn $n=20$ times in $p=3$ seconds, and lose $r=12\%$ of their forward motion by slipping on the smooth steel rails, at what rate per hour is the locomotive moving over the rails?

147. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defianca, O.

Stock bought $m=10\%$ above par pays $p=8\%$ on the investment. What per cent. will it pay if bought at $n=10\%$ discount?

*** Solutions of these problems should be sent to B. F. Finkel not later than Nov 10.

ALGEBRA.

142. Proposed by A. H. BELL, Hillsboro, Ill.

If x/y is the convergent preceding the complete quotient $(\sqrt{A}+m)/n$; prove that $x^2-Ay^2=\pm n$.

143. Proposed by JOHN M. COLAW, A. M., Monterey, Va.

Solve $x+y+z+u=a$....(1).

$x^2+y^2+z^2+u^2=b$....(2).

$x^3+y^3+z^3+u^3=c$....(3).

$x^4+y^4+z^4+u^4=d$....(4).

144. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, O.

Show that the number of ways in which 15 different problems may be distributed among 5 students so that each student shall have three of them, is $N=(5.3)!/(3!)$.

*** Solutions of these problems should be sent to J. M. Colaw not later than Nov. 10.

GEOMETRY.

172. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette. Stroud, Gloucestershire, England.

The center N of the 9-point circle of a triangle ABC lies on P, the pedal line of a point on the circumcircle. Find the angle of intersection of P and AB.

173. Proposed by P. C. CULLEN, Principal of Schools, Indianola, Neb.

To construct circle tangent to a given line at a given point such that tangents drawn to this circle and passing through two fixed points shall be parallel.